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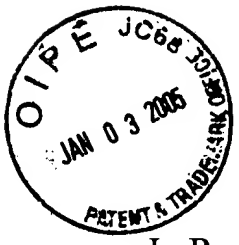

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the application of:

Applicant: Glenn Knight

Serial No.: 09/891,326

Filed: 07/27/2001

Title: REVERSE FLOW CATALYTIC MUFFLER

Our Ref.: T8466414US

Examiner: TRAN, Hien Thi

Art Unit: 1764

RESPONSE

To: Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Date: December 30, 2004

This is in response to the office action dated October 4, 2004 in the above case. Please amend the drawings, disclosure and claims in accordance with the revisions set out on the following pages.

Figure 3 is an elevational view of the catalytic muffler of Figure 1;

Figure 4 is an end elevation of the left side of the catalytic muffler of Figure 1;

Figure 5 is an end elevation of the right side of the catalytic muffler of Figure 1;

Figure 6 is a section on line 6-6 of Figure 3;

Figure 7 is a section on line 7-7 of Figure 3;

Figure 8 is a perspective view of an alternate embodiment of a catalytic muffler according to the present invention having an end inlet and a side outlet;

Figure 8A is a perspective view of another alternate embodiment of a catalytic muffler according to the present invention having a side inlet and a side outlet; and,

Figure 9 is an exploded view of an alternate embodiment catalytic muffler according to the present invention;

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A catalytic muffler according to the present invention is generally indicated by reference 10 in the accompanying illustrations. The catalytic muffler 10 is illustrated as having a generally cylindrical housing 12 however it will be appreciated that other shapes of housing might also be utilized.

The housing 12 has a first chamber 14 at one end thereof, and, a second chamber 16 at the opposite end. A [catalyst] reactor bed 18 occupies the space

between the first chamber 14 and the second chamber 16. The [catalyst] reactor bed 18 may be a catalyst bearing ceramic (or possibly other) substrate having a honeycomb like configuration with a plurality of discreet flow passages 20 extending longitudinally therethrough. Accordingly, the first and second chambers, 14 and 16 respectively, fluidly communicate with each other through the reactor bed 18.

An inlet passage 30 extends through the housing 12 into the first chamber 14. Depending on the application, the inlet passage may extend into either a side (Figure 8) or an end of the housing. Also depending on the application, the inlet passage may have various configurations and include such arrangements as a threaded opening and a tubular elbow. The specific configuration chosen will generally depend on the exhaust system configuration and availability of space in the intended application.

An outlet passage 32 may extend either from the first chamber 14 or the second chamber 16. The outlet passage 32 may extend either from a side or an end of the housing 12. As with the inlet passage 30, the location and configuration of the outlet passage 32 will generally depend on the parameters associated with the intended application.

A first baffle assembly 40 is housed within the first chamber 14. The first baffle assembly 40 is a member with a generally T-shaped configuration. The member extends between the housing 12 and the reactor bed so as to divide the first chamber 14 into first, second and third parts, 42, 44 and 46 respectively. The first part 42 and the third part 46 each represent about one fourth (1/4) of the volume of the first chamber 14. The third part represents about one half (1/2) of the volume of the first chamber 14.

A second baffle assembly 50 is housed within the second chamber 16 and extends between the housing 12 and the reactor bed 18 to divide the second chamber into first and second parts 52 and 54 respectively. The first part 52 and the second part 54 are of roughly equal volume.

The first baffle assembly 40, second baffle assembly 50, housing 12 and reactor bed 18 cooperate to define a flow passage through at least first, second and third discreet zones, 60, 62 and 64, respectively, of the reactor bed 18.

Gas is therefore directed to flow from the inlet passage 30 into the first part 42 of the first chamber 14, through the first zone 60, through the first part 52 of the second chamber 16, through the second zone 62 of the reactor bed 18 into the second part 44 of the first chamber 12 and through the third zone 64 of the reactor bed into the second part 54 of the second chamber [18] 16. If the outlet passage 32 communicates with the second part 54 of the second chamber 18, gas will be discharged therethrough.

If the outlet passage 32 communicates with the third part 46 of the first chamber 14, gas will flow from the second part 54 of the second chamber 16 through a fourth zone 66 of the reactor bed, into the third part of the first chamber 14 and out through the outlet 32. In this latter embodiment, gas will flow four times through the reactor bed 18 albeit through a different zone each time. In the former embodiment, gas will flow three times through the reactor bed 18, through a different zone each time.

The reactor bed 18 may itself be made up of more than one section and one section may bear an oxidizing catalyst with another section bearing a reducing catalyst. It is expected that the catalytic muffler 10 will be more effective if the reducing section is upstream of the oxidizing section, for example, if the first zone

60 and second zone 62 promote reduction and the third zone 64 and fourth zone 66 (if there is a fourth zone) promote oxidation.

One manner of configuring the catalytic muffler 10 is illustrated in the exploded view of Figure 2. The housing 12 is made up of first and second disc-shaped parts 80 and 82 which may be joined at respective outer edges to a sleeve 90. The first baffle member or assembly 40 may be generally P-shaped, or alternatively, T-shaped and act as a spacer to locate the reactor bed 16 within the housing 12. The second baffle member or assembly 50 may be rectangular or alternatively, generally D-shaped and act as a further spacer to locate the reactor bed 18 within the housing 12. Retainer rings 92 may also be provided to engage the interior of the sleeve 90 to locate the reactor bed 18.

Alternatively, as illustrated in Figure 2B the housing 12 may be in three parts with a first cup-shaped part 88 and second cup-shaped part 92 capping opposite ends of the sleeve 90.

As yet a further alternative, the housing may be made up of first and second cup-shaped parts 94, 96 respectively which may be joined at respective outer edges 98 and 100.

The above description is intended in an illustrative rather than a restrictive sense. Variations to the exact structures described may be apparent to those skilled in such structures without departing from the spirit and scope of the present invention as defined by the claims set out below.